Exploring the Frontiers of Health: An Updated Review of Nutritional Benefits of Rice Bran Oil

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Discover Rice Bran Oil – A Unique and Versatile Edible Oil

Rice Bran Oil (RBO)- Extracted from rice husk; rich in MUFAs, PUFAs, γ-oryzanol, tocopherols, and tocotrienols.

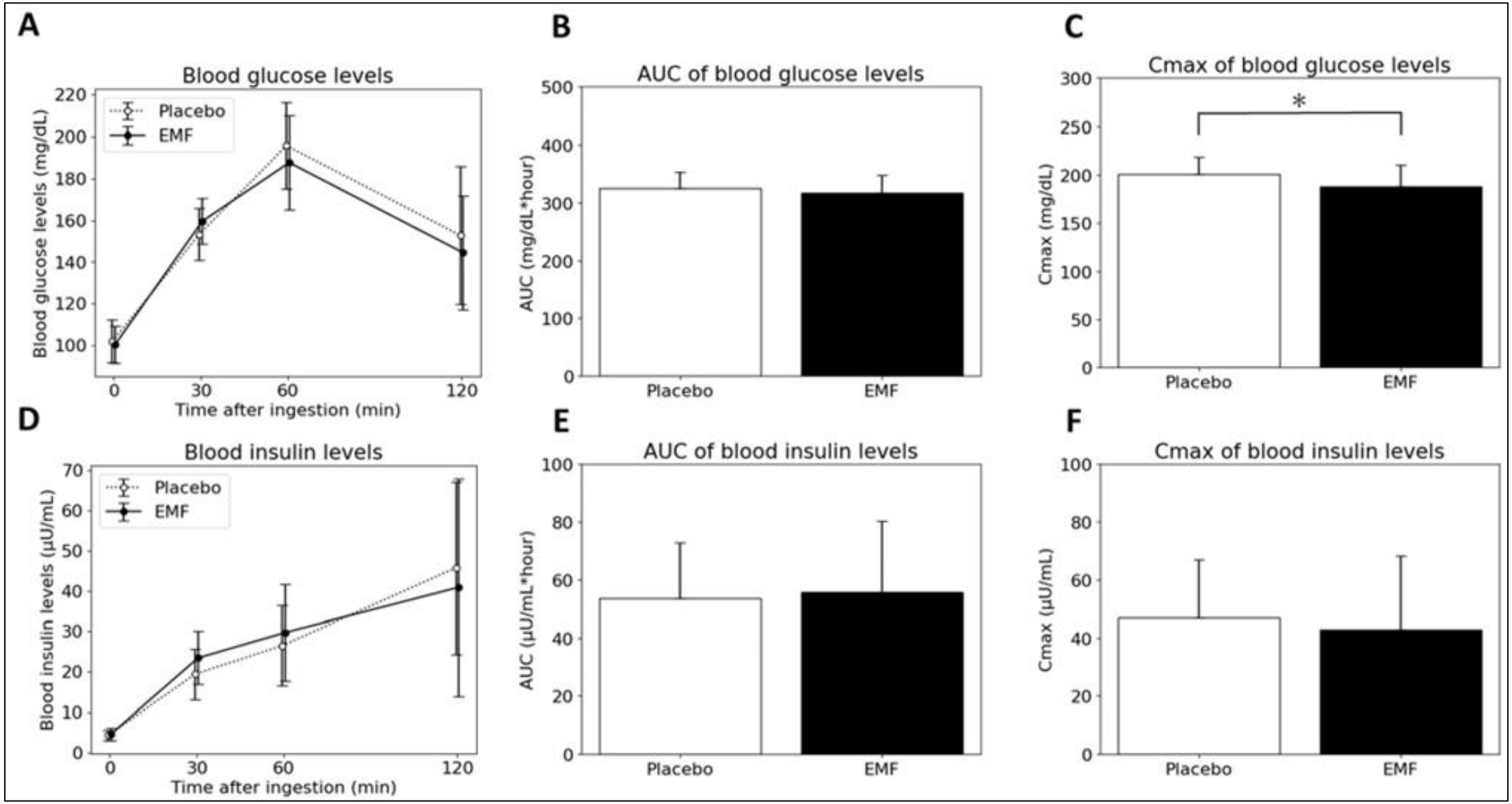
Health Benefits-Lowers hypercholesterolemia and helps control Type 2 Diabetes in humans and animal models.

5-Week RBO Diet- Improved lipid profiles, reduced atherogenic index, suppressed hyperinsulinemia.

Gamma-Oryzanol- Anti-diabetic and cholesterol-lowering effects.

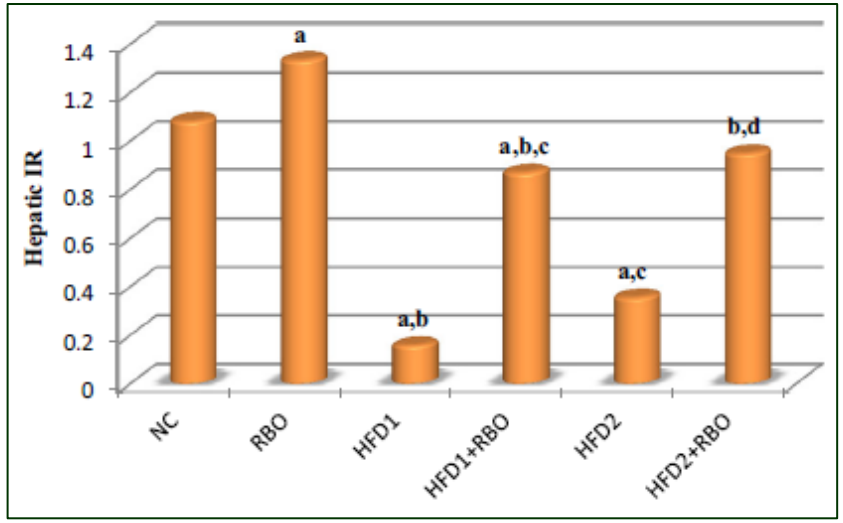
Liver Protection-Inhibits hepatic fat accumulation and inflammation.

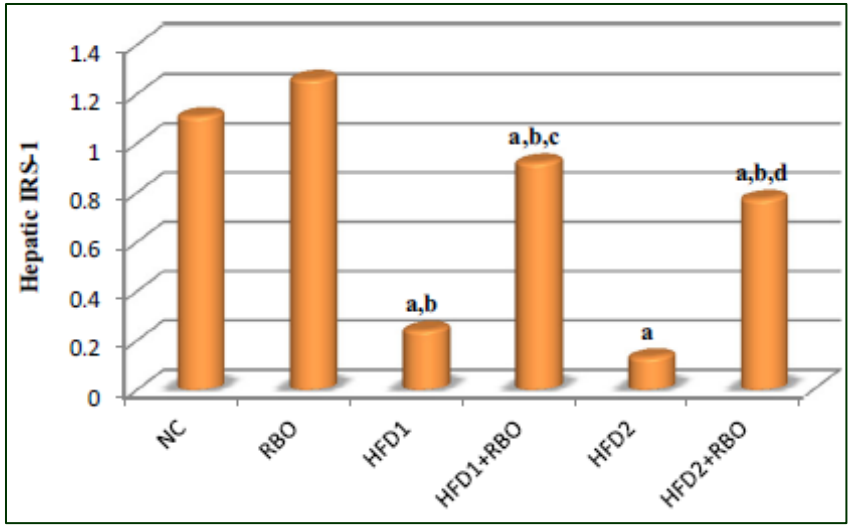
RBO Emulsified Formulation Improves Glycemic Response

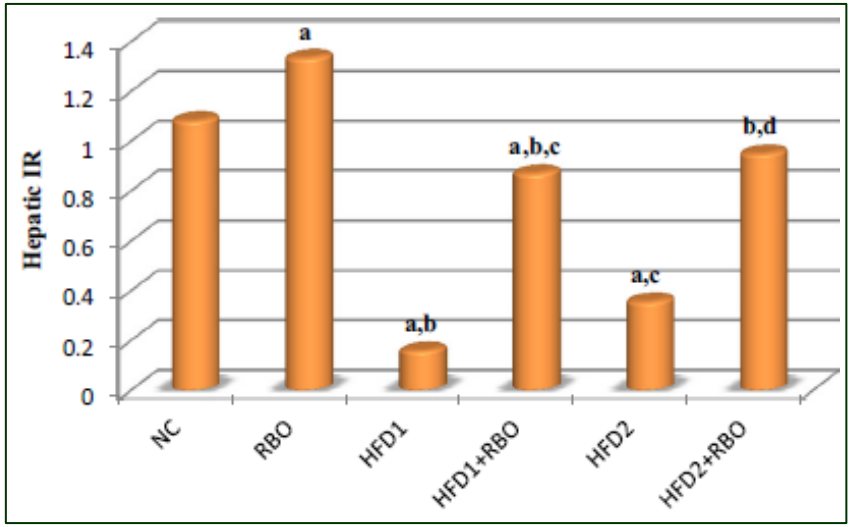


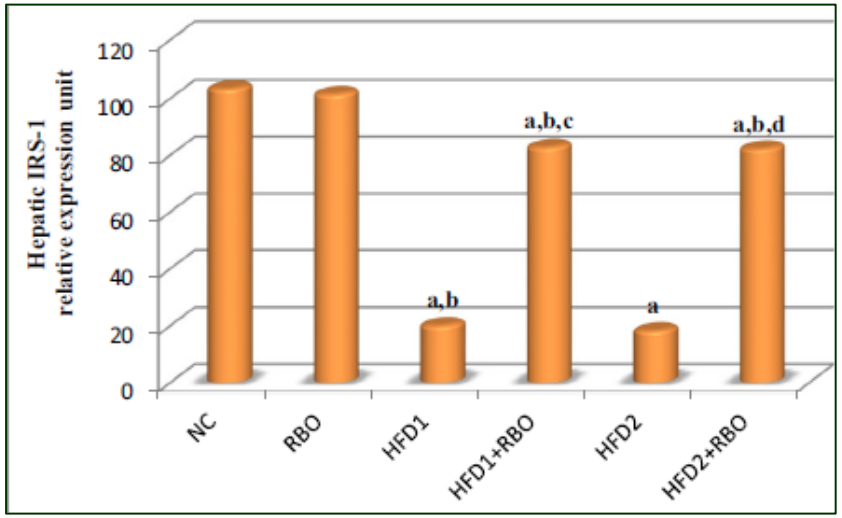
Kawada N, et al. Foods. 2024;13(16):2628

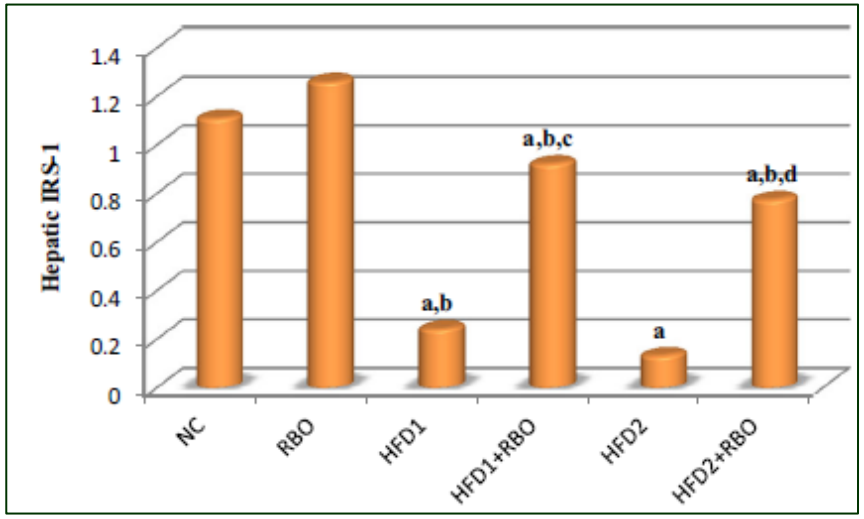
Rice Bran Oil Ameliorates Hepatic Insulin Resistance

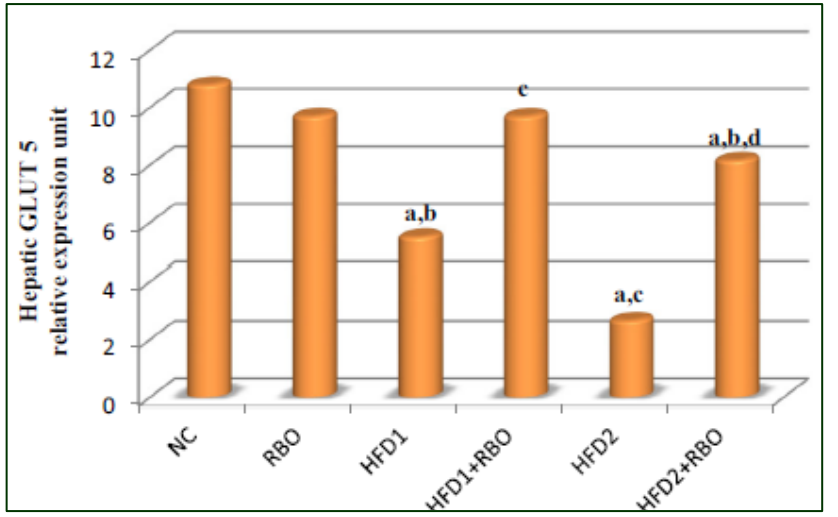








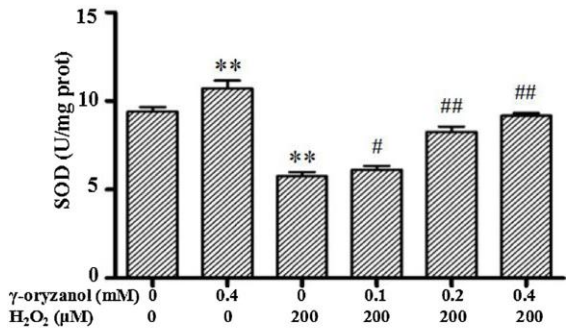


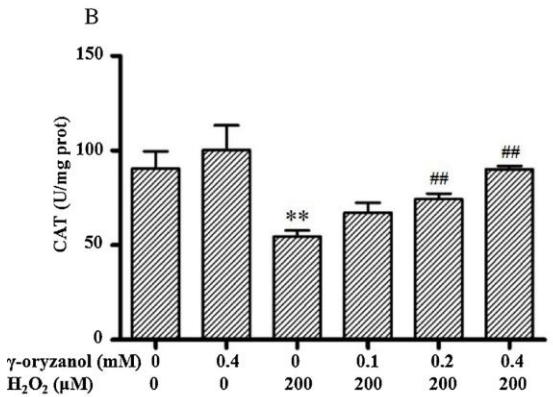


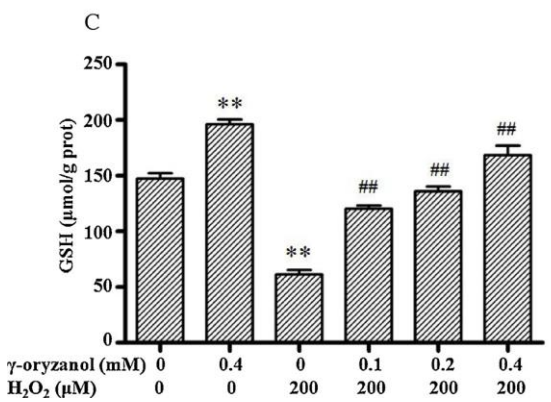
- RBO markedly increased these insulin receptors.
- RBO significantly increased the expressions of GLUT4 and 5

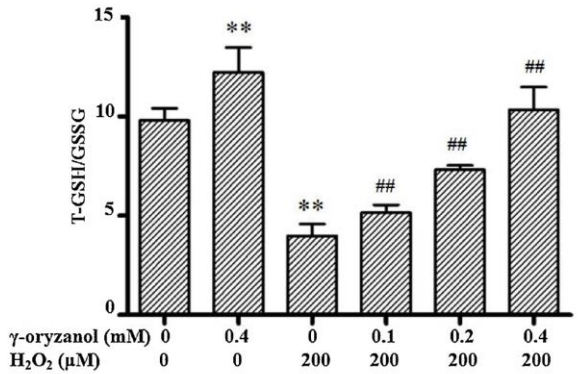
Mohamed MA et al. J Diabetes Metab Disord. 2019;18(1):89-97

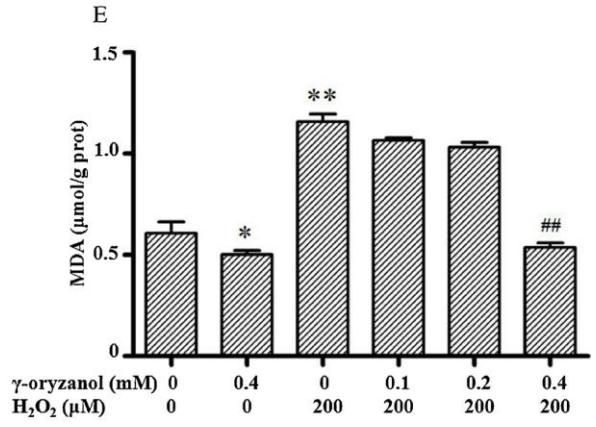
Gamma-Oryzanol on Antioxidant System and Apoptosis

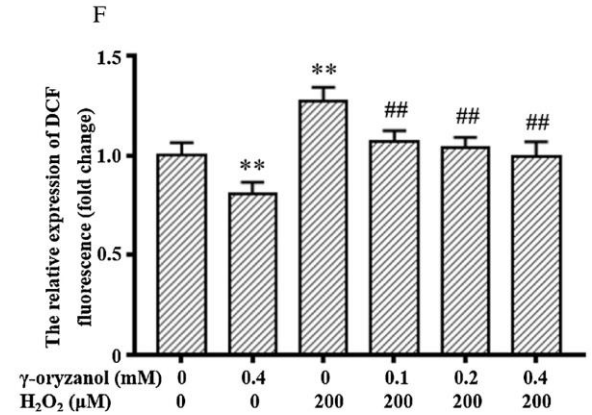


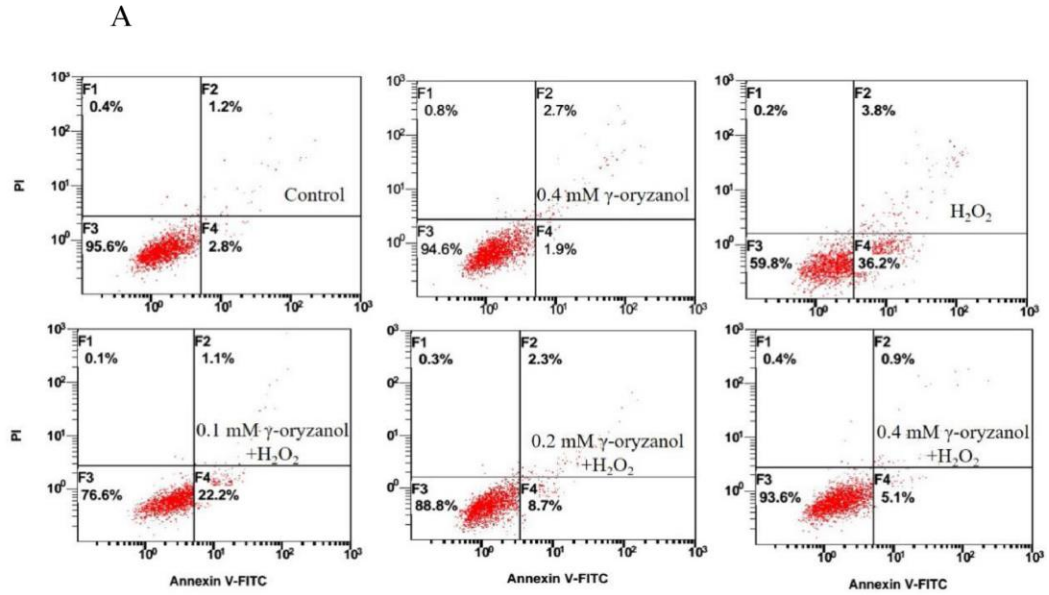


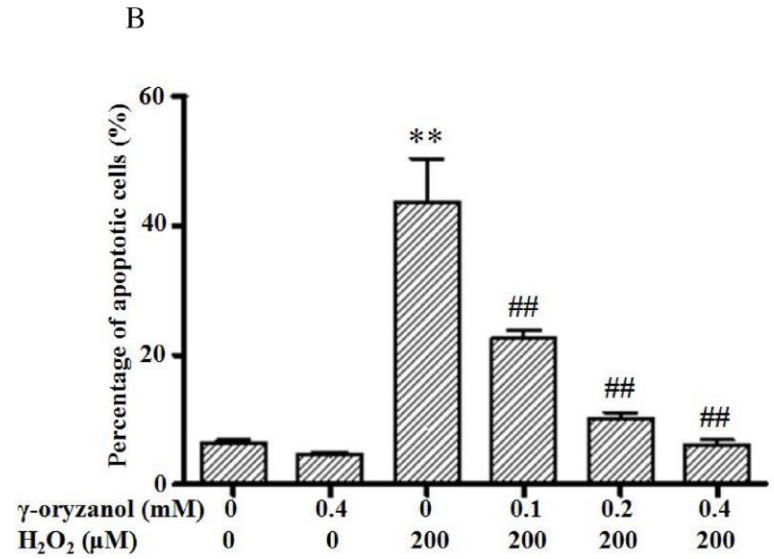












Huang L et al. Biomed Pharmacother. 2020;121:109554.

Rice Bran Oil/Sesame Oil Blend (80:20) Battles Against Hypertension, Hyperglycemia and Improves Lipids

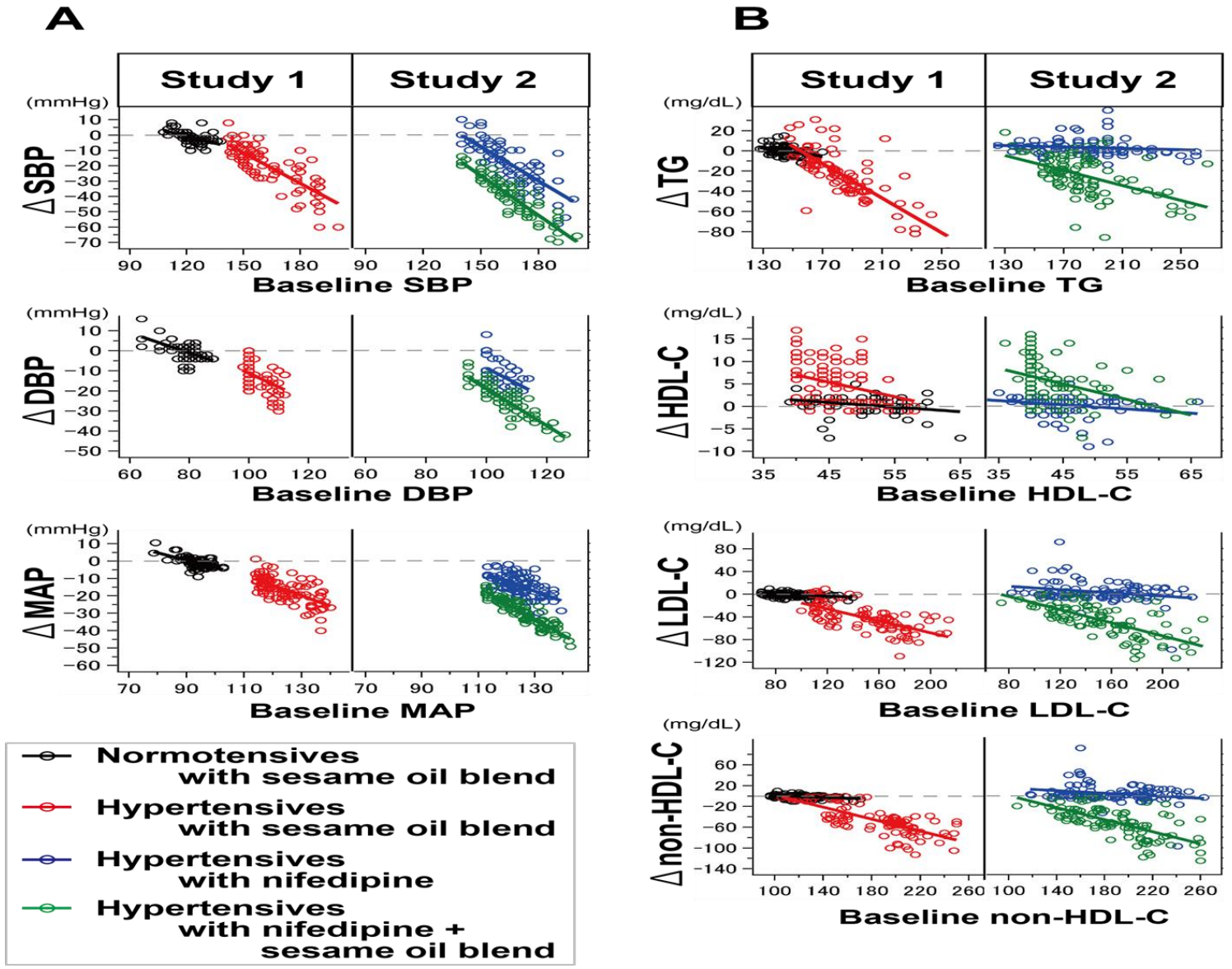
Randomized Controlled Trials

Devarajan et al. J Clin Lipidol. 2016;10(2):339-49

Devarajan et al. Am J Med . 2016;129(7):731-9

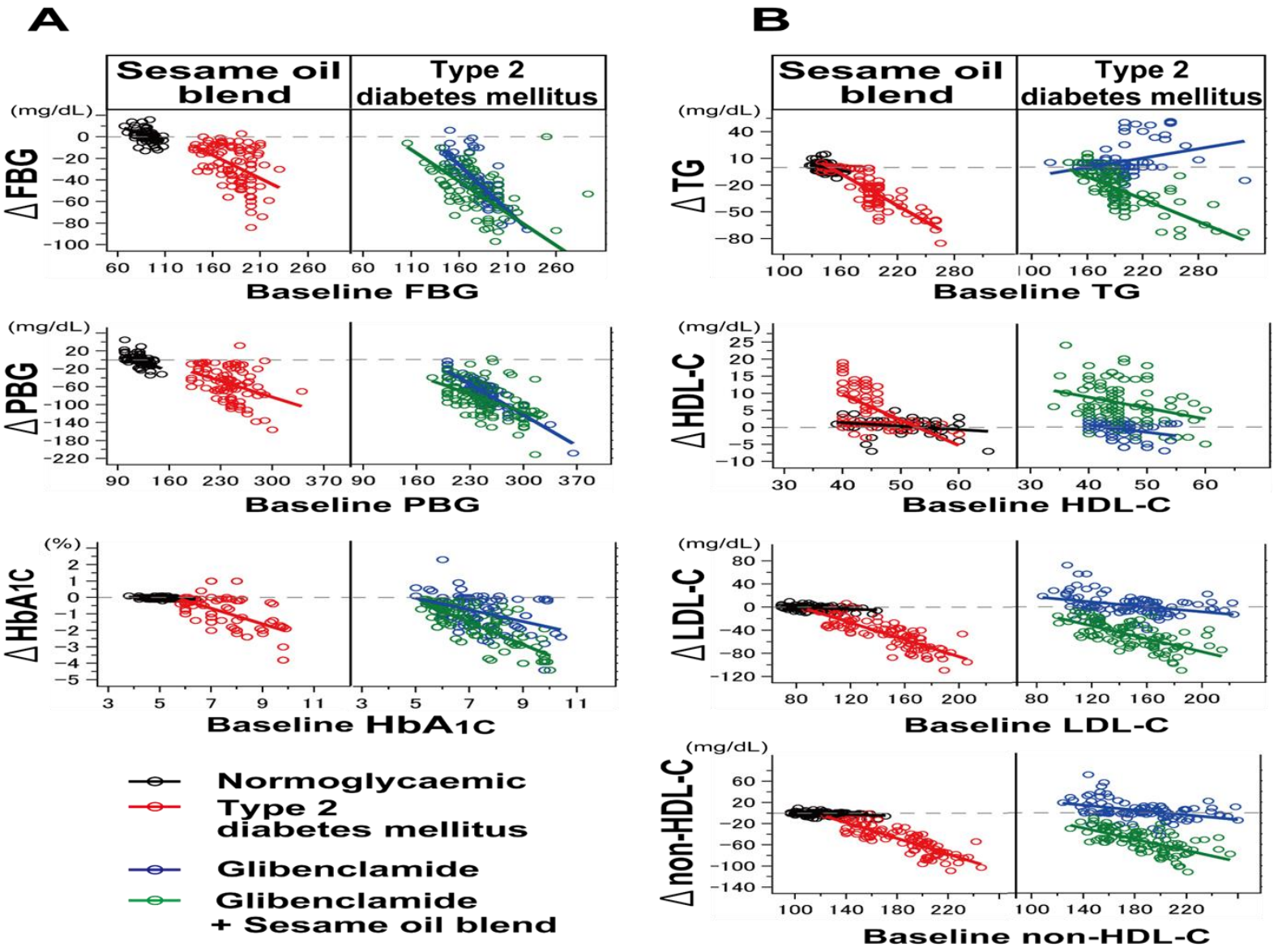
RBO/Sesame Oil Blend Lowers BP and Improves Lipids

	Normotensives			Hypertensives			
	Sesame oil blend (n=100)	Sesame oil blend (n=100)		Nifedipine (n=100)	Nifedipine + Sesame oil blend (n=100)		
	Study 1		Group* period interaction (P value)	Study 2			Group* period interaction (P value)
SBP (mmHg)							
0 days	122 ± 6	164 ± 17 †		164 ± 14	164 ± 14		
15 days		155 ± 14 *		153 ± 12 *	149 ± 12	* †	
30 days		149 ± 13 *		149 ± 11 *	134 ± 9	* †	
45 days		145 ± 8 *		146 ± 6 *	127 ± 7	* †	
60 days	120 ± 5	143 ± 10 * †	<0.001	146 ± 8 *	125 ± 6	* †	<0.001
DBP (mmHg)							
0 days	79 ± 4	104 ± 5 †		104 ± 5	106 ± 7	†	
15 days		98 ± 4 *		97 ± 5 *	95 ± 5	* †	
30 days		94 ± 4 *		96 ± 5 *	91 ± 6	* †	
45 days		92 ± 5 *		93 ± 5 *	85 ± 5	* †	
60 days	79 ± 4	90 ± 6 * †	<0.001	92 ± 6 *	81 ± 4	* †	<0.001
MAP (mmHg)							
0 days	94 ± 4	124 ± 8 †		124 ± 6	125 ± 8		
15 days		117 ± 6 *		116 ± 6 *	113 ± 6	* †	
30 days		112 ± 6 *		114 ± 6 *	105 ± 6	* †	
45 days		110 ± 5 *		111 ± 5 *	99 ± 5	* †	
60 days	93 ± 3	108 ± 6 * †	<0.001	110 ± 6 *	96 ± 3	* †	<0.001
TC (mg/dL)							
0 days	172 ± 14	230 ± 33 †		231 ± 32	232 ± 34		
60 days	171 ± 14	188 ± 23 * †	<0.001	235 ± 32 *	186 ± 25	* †	<0.001
TG (mg/dL)							
0 days	145 ± 8	182 ± 23 †		186 ± 30	184 ± 27		
60 days	145 ± 8	159 ± 15 * †	<0.001	189 ± 31 *	159 ± 24	* †	<0.001
HDL-C (mg/dL)							
0 days	49.4 ± 5.5	45.9 ± 5.0 †		43.8 ± 5.9	43.8 ± 5.3		
60 days	49.8 ± 5.3	51.0 ± 5.6 *	<0.001	44.2 ± 5.9	49.2 ± 5.5	* †	<0.001
LDL-C (mg/dL)							
0 days	94 ± 15	149 ± 29 †		150 ± 33	151 ± 34		
60 days	92 ± 15	108 ± 22 * †	<0.001	153 ± 33	106 ± 25	* †	<0.001
non-HDL-C (mg/dL)							
0 days	123 ± 16	184 ± 34 †		187 ± 33	188 ± 34		
60 days	121 ± 15	137 ± 24 * †	<0.001	191 ± 34 *	137 ± 26	* †	<0.001

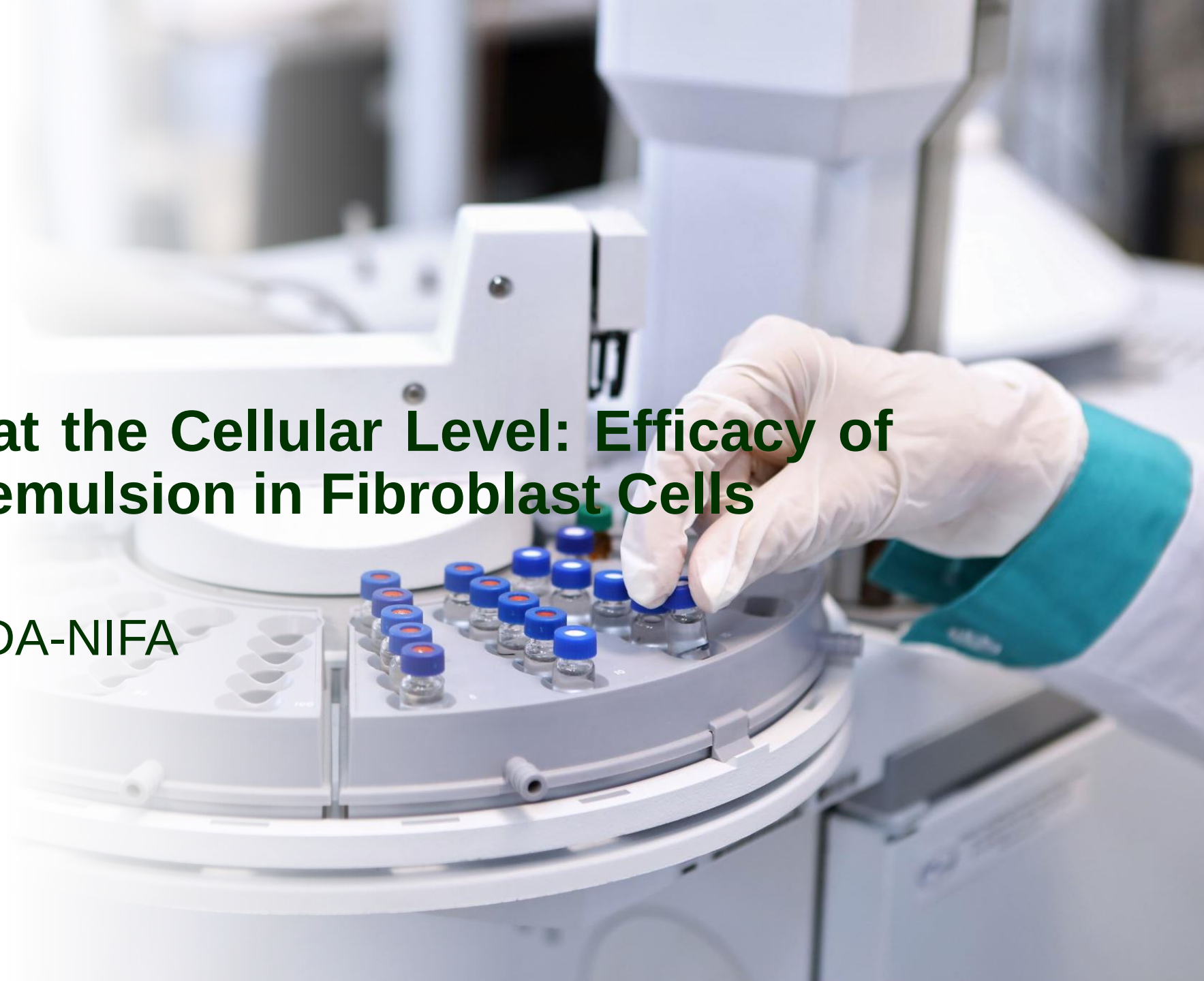

A
B
Study 1
Study 2
(mmHg)
ΔSBP
Baseline SBP
ΔDBP
Baseline DBP
ΔMAP
Baseline MAP
(mg/dL)
ΔTG
Baseline TG
ΔHDL-C
Baseline HDL-C
ΔLDL-C
Baseline LDL-C
Δnon-HDL-C
Baseline non-HDL-C
Normotensives with sesame oil blend
Hypertensives with sesame oil blend
Hypertensives with nifedipine
Hypertensives with nifedipine + sesame oil blend

RBO/Sesame Oil Blend Improves Hyperglycemia

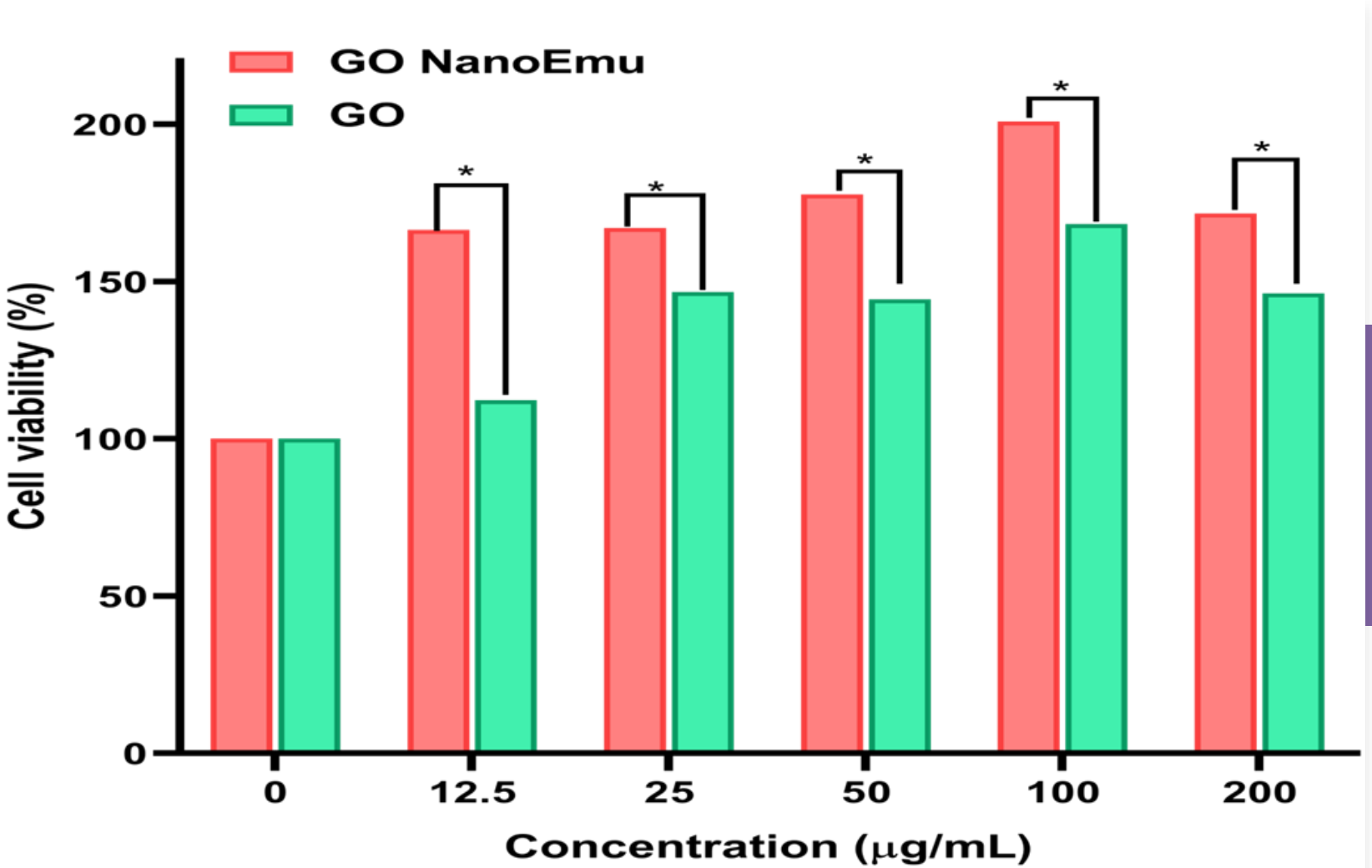
Period	Sesame oil blend		Group* period interaction	T2DM patients		Group* period interaction
	Normal subjects	T2DM patients	(P value)	Glibenclamide	Glibenclamide + Sesame oil blend	(P value)
Fasting blood glucose (mg/dL)						
0 days	93 ± 8	181 ± 0 †		180 ± 18	184 ± 37	
30 days		162 ± 24 *		153 ± 14 *	150 ± 30 *	
60 days	93 ± 7	155 ± 21 * †	<0.001	137 ± 12 *	128 ± 26 * †	0.04
Post prandial blood glucose (mg/dL)						
0 days	121 ± 10	242 ± 26 †		246 ± 27	248 ± 37	
30 days		219 ± 28 * †		220 ± 24 *	210 ± 41 * †	
60 days	119 ± 10	189 ± 36 * †	<0.001	175 ± 14 *	161 ± 37 * †	0.02
HbA_{1C} (%)						
0 days	5.1 ± 0.5	7.3 ± 1.2 †		7.3 ± 1.2	7.2 ± 1.4	
60 days	5.0 ± 0.4 *	6.5 ± 1.0 * †	<0.001	6.4 ± 1.2 *	5.6 ± 0.9 * †	<0.001
Total cholesterol (mg/dL)						
0 days	172 ± 14	230 ± 27 †		230 ± 31	231 ± 26	
60 days	171 ± 14 *	184 ± 16 * †	<0.001	233 ± 29	185 ± 20 * †	<0.001
Triglyceride (mg/dL)						
0 days	145 ± 8	193 ± 29 †		195 ± 30	196 ± 34	
60 days	145 ± 8	166 ± 15 * †	<0.001	200 ± 39 *	170 ± 24 * †	<0.001
HDL-C (mg/dL)						
0 days	49.4 ± 5.5	45.1 ± 4.5 †		44.8 ± 3.9	45.1 ± 5.6	
60 days	49.8 ± 5.3 *	50.9 ± 5.1 *	<0.001	44.4 ± 3.9	52.2 ± 6.5 * †	<0.001
LDL-C (mg/dL)						
0 days	94 ± 15	147 ± 28 †		146 ± 31	147 ± 27	
60 days	92 ± 15 *	100 ± 16 * †	<0.001	149 ± 30	99 ± 20 * †	<0.001


A
B
Sesame oil blend
Type 2 diabetes mellitus
(mg/dL)
ΔFBG
Baseline FBG
ΔPBG
Baseline PBG
(%)
ΔHbA1C
Baseline HbA1C
ΔTG
Baseline TG
ΔHDL-C
Baseline HDL-C
ΔLDL-C
Baseline LDL-C
Δnon-HDL-C
Baseline non-HDL-C
Normoglycaemic
Type 2 diabetes mellitus
Glibenclamide
Glibenclamide + Sesame oil blend

Targeting Aging at the Cellular Level: Efficacy of γ-Oryzanol Nanoemulsion in Fibroblast Cells



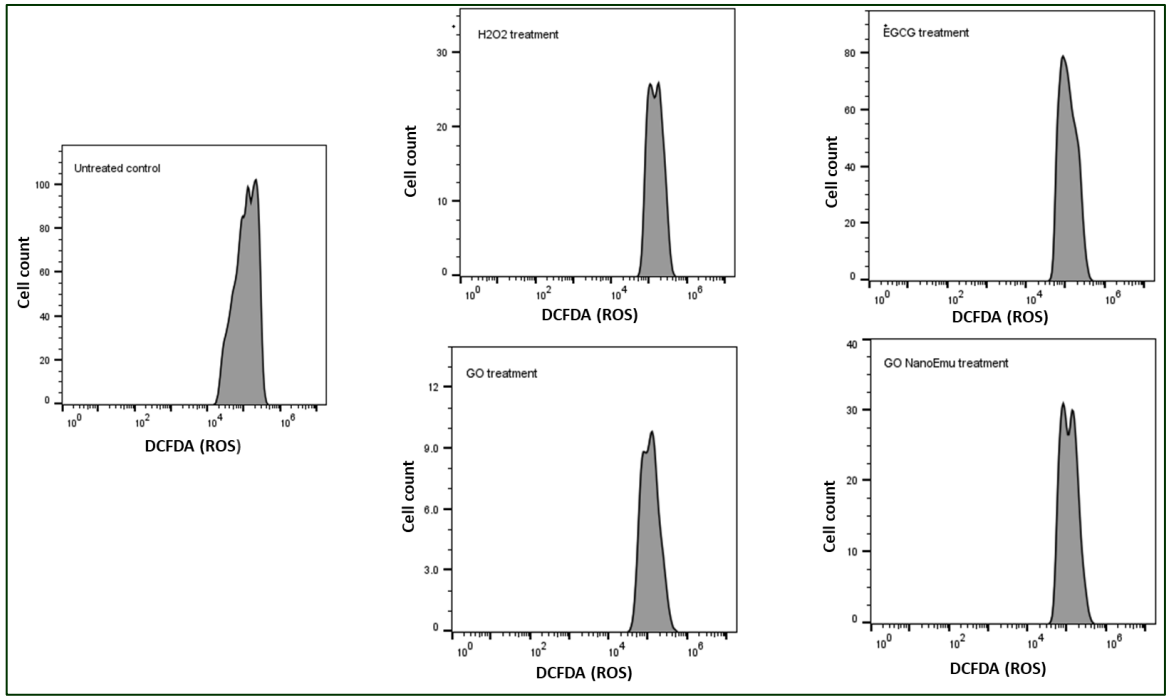
Funding Source: USDA-NIFA



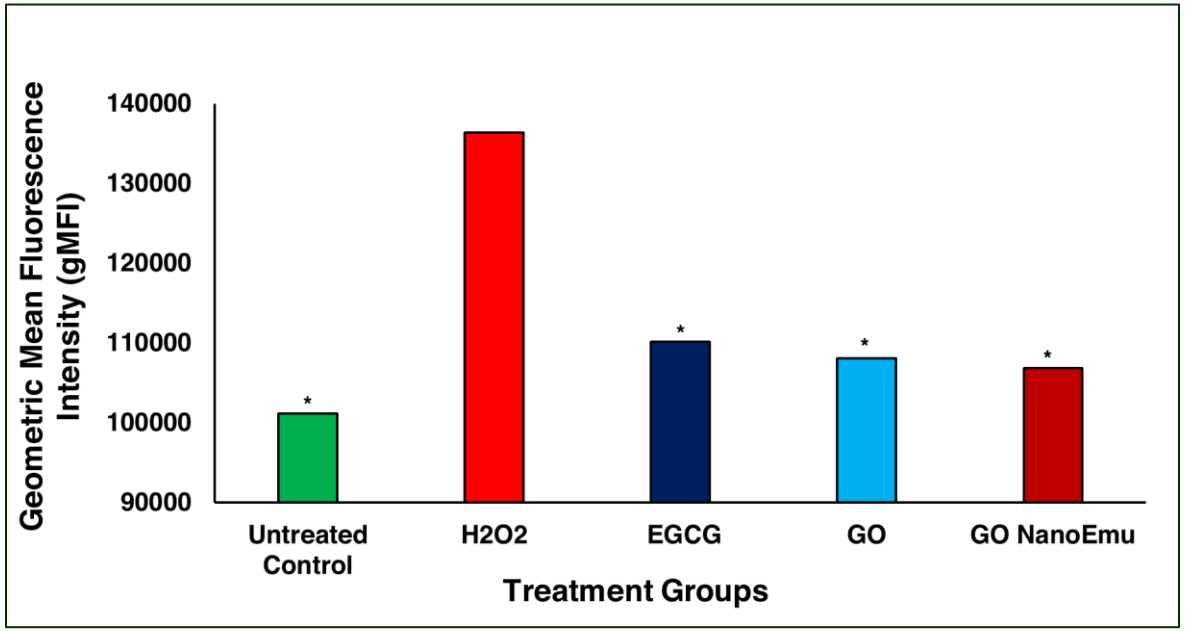
Cell Viability-γ-Oryzanol (GO) and γ-Oryzanol Nano Emulsion (GO NanoEmu)

* *P*<.05 vs. GO

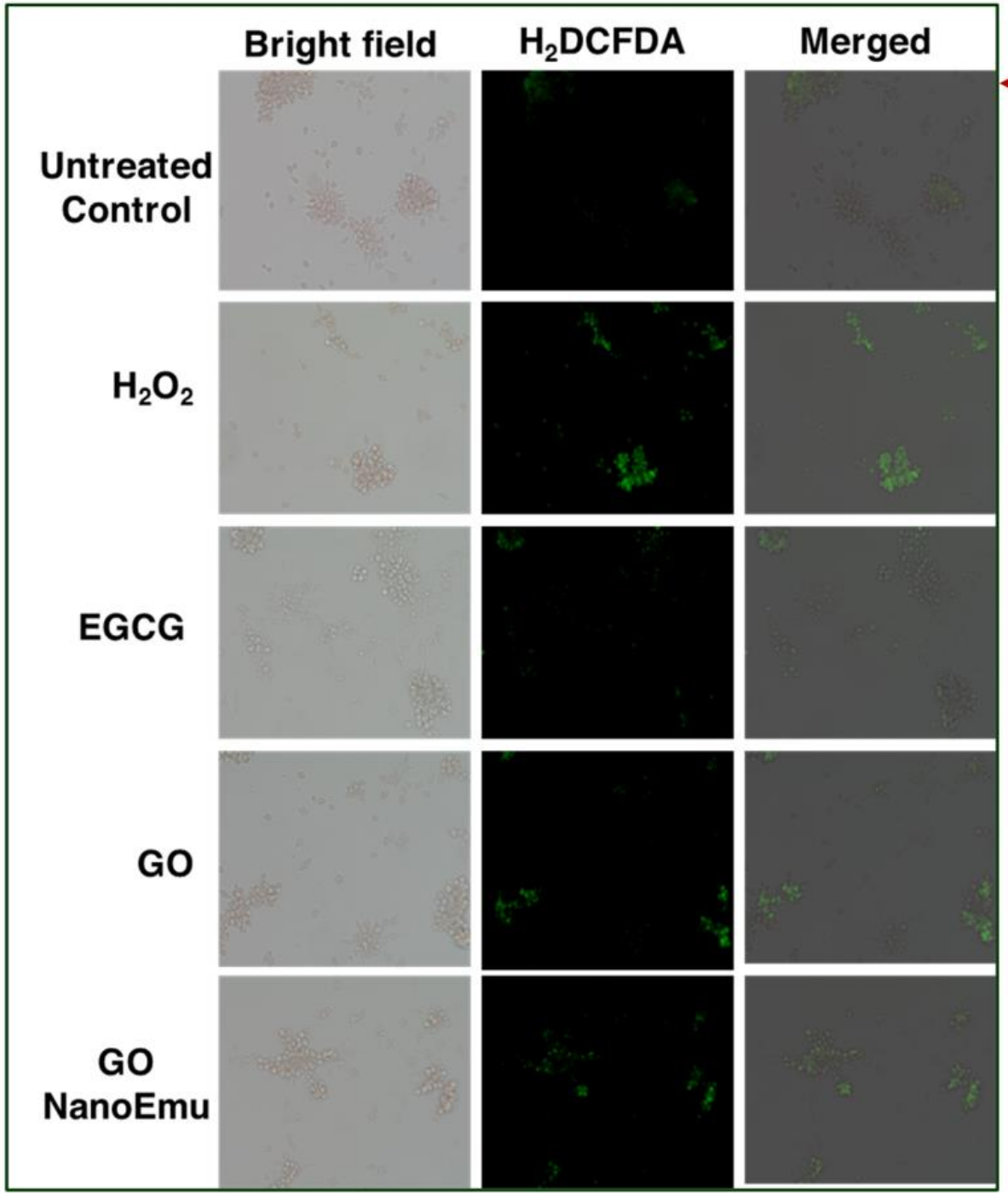
ROS Analysis By Flow Cytometry



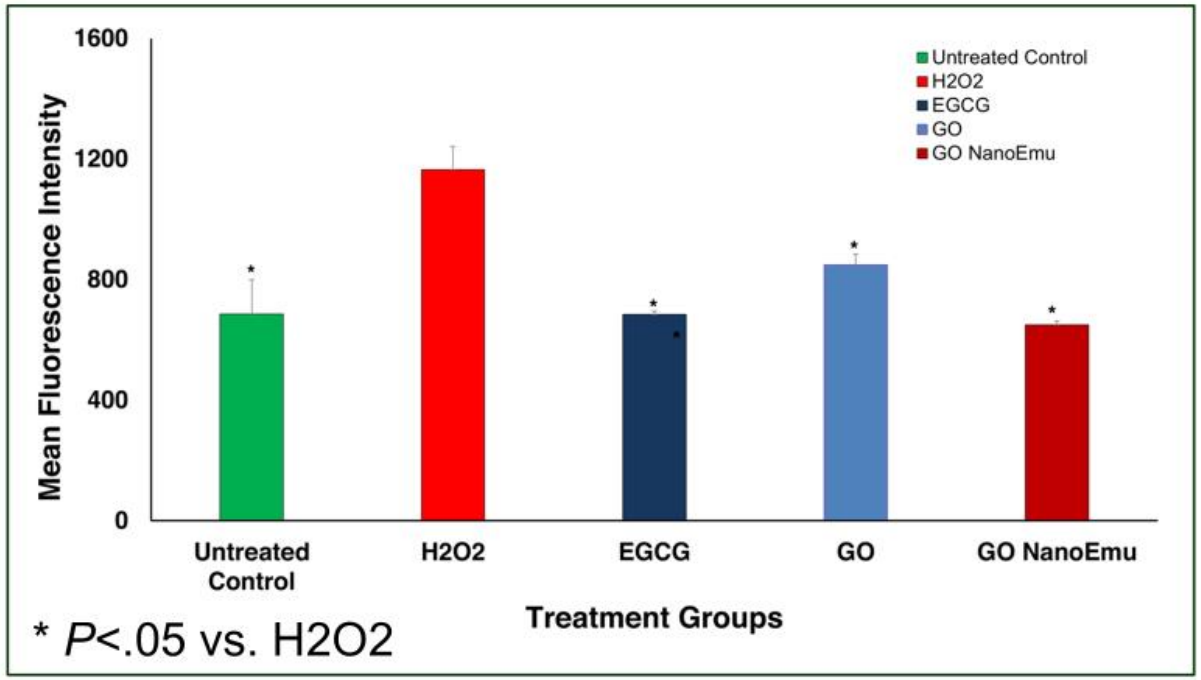
GO/GO NanoEmu Inhibits Intracellular ROS



* *P*<.05 vs. H2O2

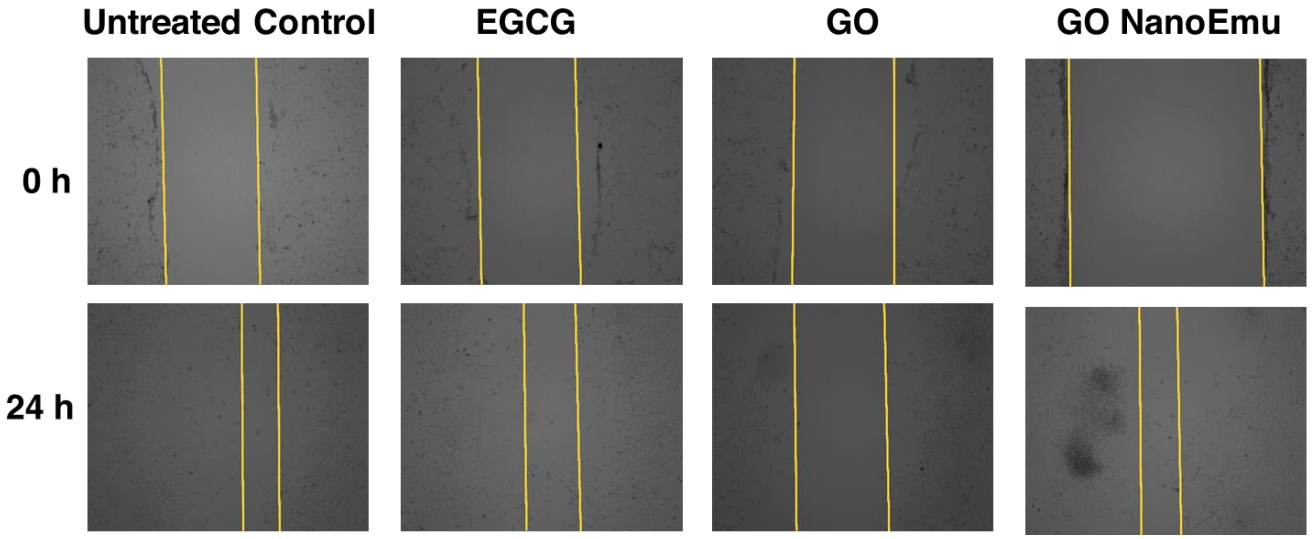


Microscopic Analysis of ROS

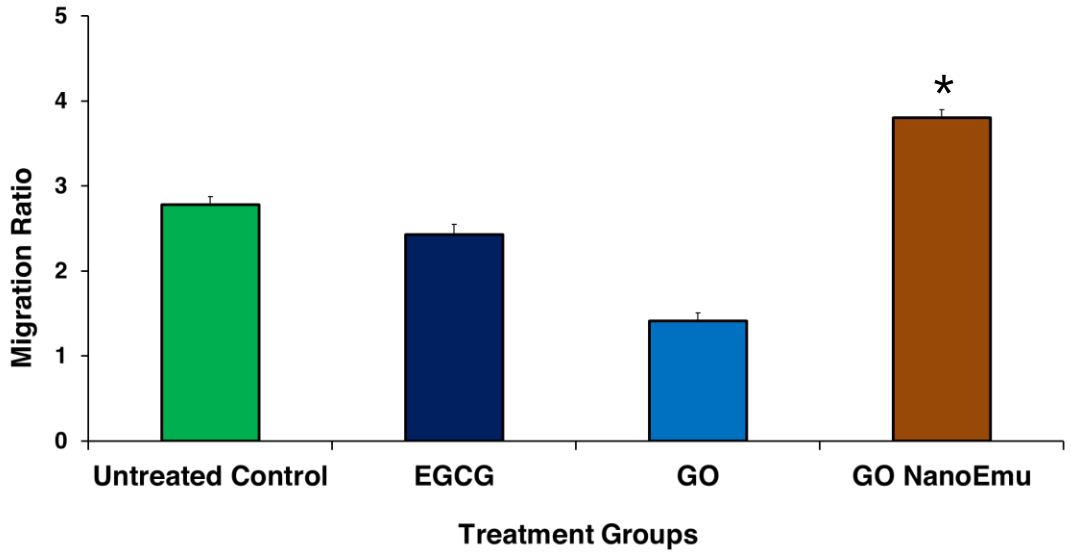


Mean Fluorescence Intensity for ROS

Wound Healing

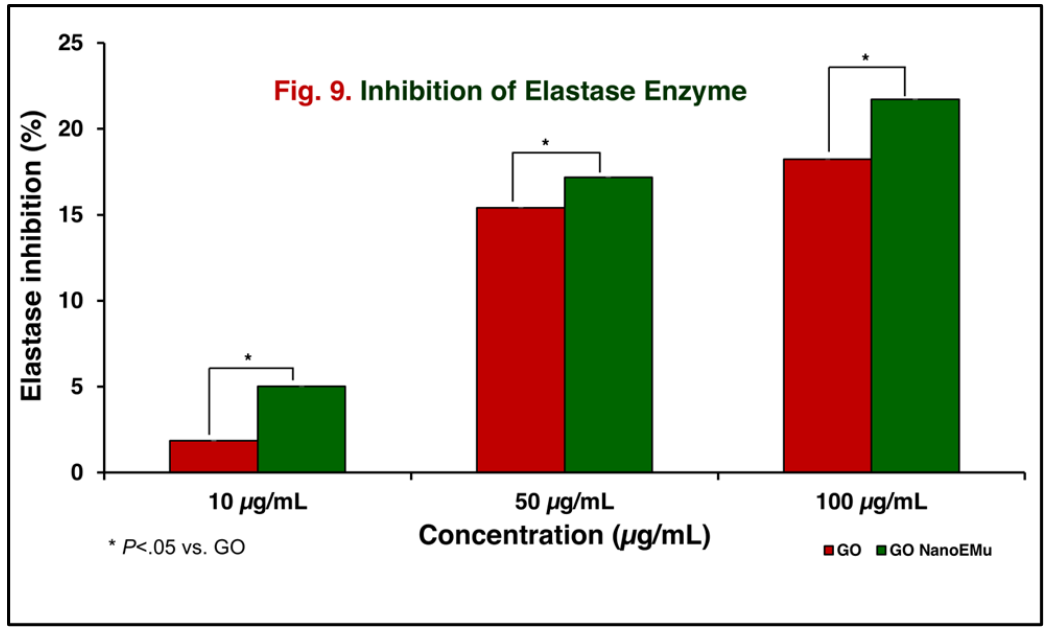


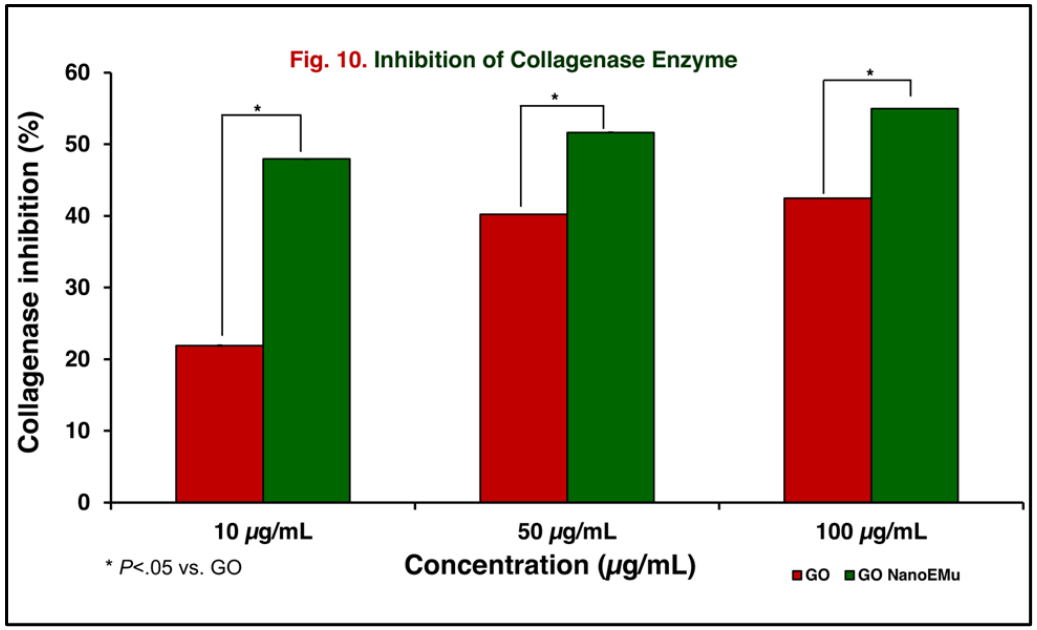
Cell Migration Ratio During Wound Healing

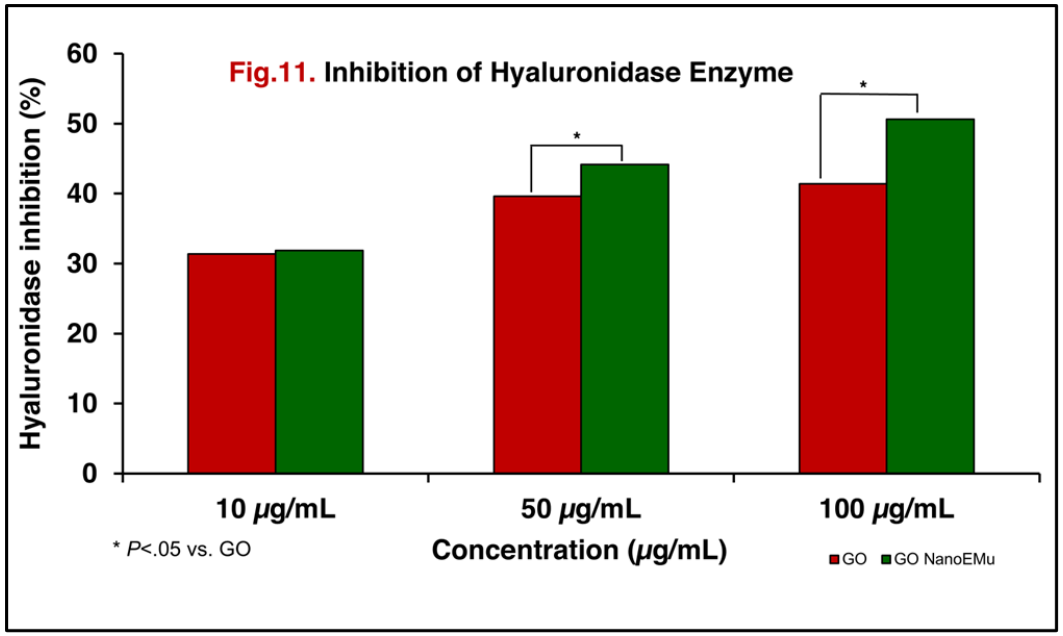


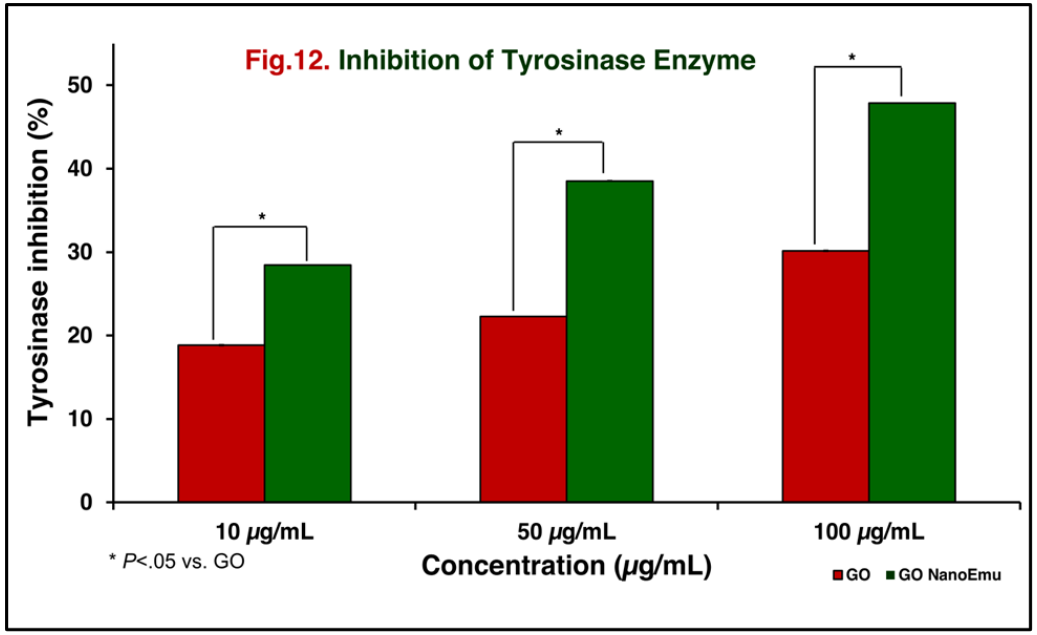
* *P*<.05 vs. UC, EGCG, GO

Inhibition of the Enzymes of the Aging Process









TAKE HOME MESSAGE!!!

Dietary Strategies are the first line of defense against diabetes and CVD

RBO offers excellent fatty acid composition and bioactive antioxidants

RBO Consumption improves lipid profile and lowers high BP, BS and lipids

Clinical Studies confirm RBO's efficacy in reducing and managing cardiometabolic diseases risk

Enjoy the Benefits of Rice Bran Oil and Have a Healthy Life

ACKNOWLEDGEMENT

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USDA-NIFA